



APEXIND INNOVATIVE INDUSTRY LLP

CHEMICAL INDUSTRY

**BUILT RIGHT. BUILT TO LAST. ENGINEERING
YOU CAN RELY ON..!**



**DESIGN | MANUFACTURING & FABRICATION | SUPPLY | INSTALLATION & COMMISSIONING
| ELECTRICAL, INSTRUMENTATION, CONTROL & AUTOMATION INTEGRATION**

**ENGINEERED SOLUTIONS COVERING RAW MATERIAL
HANDLING, PROCESS EQUIPMENT, STORAGE, MIXING,
REACTION, FILTRATION, DRYING, CONVEYING AND
UTILITY INTEGRATION, EXECUTED UNDER SINGLE-
POINT RESPONSIBILITY.**

**SINGLE-POINT
RESPONSIBILITY**

**HONEST ENGINEERING
CONTINUOUS-DUTY DESIGN**

INTRODUCTION TO CHEMICAL PLANT EQUIPMENT

Chemical manufacturing involves handling a wide range of solids, powders, liquids, slurries, solvents, intermediates, and finished products. The plant equipment must be designed with careful attention to material compatibility, corrosion resistance, process safety, cleanability, containment, and operational reliability.

Chemical plants often require customized equipment rather than standard off-the-shelf machinery. Each product has different characteristics such as viscosity, reactivity, toxicity, dusting tendency, moisture sensitivity, temperature requirement, and corrosion behaviour. The equipment design must therefore be aligned with the process requirement, operating conditions, and safety expectations of the plant.

A well-engineered chemical plant equipment package must fulfil four fundamental requirements: safe handling of raw materials and intermediates, reliable process performance, controlled transfer and storage, and ease of maintenance with proper access and isolation.

TYPICAL MATERIALS HANDLED

Typical materials handled in chemical plants include powders, granules, crystals, pellets, flakes, resins, catalysts, solvents, acids, alkalis, slurries, viscous liquids, intermediates, pigments, dyes, salts, minerals, polymers, and finished chemicals. Depending on the process, the system may also handle hazardous, corrosive, hygroscopic, toxic, flammable, or temperature-sensitive materials.

PROCESS OVERVIEW

Raw materials are received in bags, drums, IBCs, tankers, bulk containers, or silos. Solid materials may be stored in hoppers, bins, or silos and transferred through conveyors, elevators, pneumatic conveying lines, or manual charging systems. Liquids are stored in tanks and transferred through pumps, pipelines, valves, and dosing systems.

The materials are charged into process equipment such as reactors, mixers, blenders, dissolvers, dryers, filters, evaporators, or storage vessels. After processing, the product may be filtered, dried, cooled, blended, packed, or transferred to intermediate and final storage.

The actual plant configuration depends on the chemical process, batch size, production capacity, material properties, operating temperature, pressure conditions, safety classification, and level of automation required.

EQUIPMENT SUPPLIED FOR CHEMICAL PLANTS

Apexind can design, manufacture, fabricate, supply, install, and commission process equipment and material handling systems for chemical plant applications. The principal equipment categories are outlined below.

- Reactors, Agitators and Process Vessels:** Jacketed reactors, limpet coil reactors, agitated vessels, pressure vessels, atmospheric vessels, and process tanks can be supplied in MS, SS 304, SS 316, or other suitable materials as per process requirement. Designs can include agitators, impeller types may include paddle, anchor, turbine, pitched blade, propeller, baffles, nozzles, manholes, supports, insulation, heating or cooling arrangements, and instrumentation provisions.



- ❑ **Ribbon Blenders and Powder Mixers:** Used for dry powder mixing, granule blending, additive mixing, and product homogenization. Blenders can be supplied with U-trough construction, double helical ribbons, lump breakers, bottom discharge valves, inspection covers, and dust-tight charging arrangements.
- ❑ **Storage Tanks and Day Tanks:** MS, SS, jacketed, insulated, horizontal, vertical, cylindrical, rectangular, and custom storage tanks can be supplied for chemicals, solvents, water, oils, slurries, and intermediates. Tanks can be designed with level indication, vents, drains, manholes, supports, and access platforms.
- ❑ **Evaporators and Distillation Equipment:** Evaporators, columns, condensers, receivers, and associated process equipment can be developed for concentration, solvent recovery, separation, and purification applications. Equipment is configured as per process requirement and client inputs.
- ❑ **Screw Conveyors and Powder Transfer Systems:** Used for enclosed transfer of powders, granules, crystals, and additives. Screw conveyors can be supplied in U-trough or tubular construction with dust-tight covers, inlet and outlet transitions, inspection ports, and drive arrangements.
- ❑ **Bucket Elevators and Belt Conveyors:** Used for bulk solid transfer where powders, flakes, pellets, or granules are handled in larger quantities. Equipment is designed considering flowability, dust generation, lump size, moisture content, and containment requirement.
- ❑ **Pneumatic Conveying Systems:** Suitable for enclosed transfer of powders and fine materials over short or long distances. Systems may include blowers, rotary airlocks, conveying pipelines, diverters, receivers, filters, and control panels. Suitable for applications where dust-free and enclosed transfer is required.
- ❑ **Hoppers, Silos and Intermediate Bins:** Designed for raw materials, intermediates, powders, additives, and finished products. Flow geometry, discharge angle, liners, vibration assistance, aeration, and level indication can be provided as required.
- ❑ **Technological Structures, Platforms and Skids:** Equipment support structures, maintenance platforms, access ladders, pipe supports, skid-mounted assemblies, and integrated process skids can be supplied to suit plant layout and installation requirements.



THE APEXIND TURNKEY SCOPE

Apexind undertakes chemical plant equipment and material handling packages on a single-point responsibility basis. Clients work with one team for engineering, manufacturing, fabrication, supply, installation, and commissioning of the agreed equipment package.

- ❑ **Concept and Detailed Engineering:** Each project begins with understanding the process requirement, material properties, batch size, operating conditions, area classification, utility availability, layout constraints, and client expectations. Apexind develops process equipment sizing, mechanical design, layouts, fabrication drawings, support structures, and integration details.
- ❑ **Manufacturing and Fabrication:** Process equipment, tanks, vessels, conveyors, hoppers, skids, platforms, piping supports, and fabricated assemblies are manufactured and fabricated as per approved drawings and project specifications. Material selection is done based on process compatibility, corrosion requirement, and duty conditions.
- ❑ **Supply, Installation and Commissioning:** Apexind can execute equipment supply, site erection, alignment, mechanical installation, trial runs, and commissioning support. Integration with client-supplied process equipment, utilities, and plant infrastructure can be undertaken as per project scope.
- ❑ **Electrical, Instrumentation, Control and Automation:** Apexind can integrate motor control panels, instrumentation, level sensors, temperature sensors, pressure instruments, load cells, VFDs, PLC, HMI, interlocks, alarms, recipe control, and batch reporting systems based on client requirement.
- ❑ **Equipment Outside Our Manufacturing Scope:** Certain items such as specialized pumps, proprietary filters, compressors, chillers, PLC hardware, drives, weighing electronics, flameproof instruments, specialty valves, and certified safety devices may fall outside our direct manufacturing range. These can be procured from established vendors and integrated into the system, or supplied by the client for integration.

WHY APEXIND

More than 2 decades of engineering experience • Strong understanding of bulk material handling • In-house design and fabrication capability • Practical solutions for dusty and abrasive applications • Strong vendor network • Honest timelines • Honest costing • Single-point accountability.



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